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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Tight Fit

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PSYCHOLOGY

From Now On: Behavior

A more scientific knowledge of human behavior and an application of the principles in relations between nations is a must for the future in order to realize world peace.

By WATSON DAVIS

Twenty-third in a series of glances forward in science.

➤ TO keep people from fighting each other, either in the sense of a cold or a hot war, is the objective of international relations among nations, as well as all government and policing within nations and the states.

Peace in the world is to a large extent an extension to nations of the problems that all of us have within our families, cities and states.

Relations between nations have been traditionally the problems of diplomats, military men, industrialists, business men, and historians.

As the world recovers from the physical and mental wounds of two great world wars, some of those charged with running the world have awakened to the possibility that scientists can help them in the maintenance of the peace. Psychological warfare was used effectively in fighting the war. Psychological welfare can be promoted to keep the peace.

Even nations which regard themselves as most friendly neighbors have areas of tension. There is conflict in the cold war as there is in a fighting war.

The facts in these tensions on an international scale are beclouded by stereotyped thinking, nationalistic feeling, catch phrases and slogans. This is just as true of world politics as it is in a hard-fought, "dirty" city election.

In recent years sociologists, anthropologists and psychiatrists have learned a great deal about the way in which people think and feel. They know that what often seem to be the obvious reasons for an action are not at all the causes. There are hidden reasons for many things that happen—hidden in the human mind and past experience.

There has been a great advance in methods of determining, by polls, questionnaires, by probing into attitudes, by interviews, just what people feel and why they do what they do. There have been practical experiments on how to modify and change attitudes which may cause trouble in the world. Conflicts over "race" and prejudices against Negroes, Jews, Communists or any other minority group are often caused by lack of information or experience and background.

Why are groups often hostile toward other groups? The influences that make for aggressive nationalism are very important in our world which is so far from being united. History is full of examples, as in Germany and Japan, where a military career was the highest achievement to which a boy could look forward. Militarism may be ingrained in the culture, and yet this does not mean that war is inevitable, or that it is a fundamental part of human nature.

The psychiatrists study hostile individuals bent upon personal or social harm. These individuals throw some light upon the origins of war itself.

An important achievement of UNESCO has been the study of the whole problem of these so-called social tensions affecting international understanding. Dr. Otto Klineberg of Columbia University has just brought together a survey of research in this field.

As yet the experts in this field of science do not sit down with the statesmen and the generals and the admirals.

For the future we may expect:

A. Those who understand human behavior—why people act the way they do—will play a larger role in advising on the conduct of international relations and the preventing of future wars.

B. Just as the people generally now have a better idea of the usefulness of psychology and psychiatry in the conduct of their personal and family lives, so there will be more general understanding of the need of exploring human behavior in relations between peoples and nations.

C. The peace-promoting activities of the various United Nations agencies, our Department of State and the equivalent organizations in other countries will be more firmly based upon the facts of human behavior.

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VETERINARY MEDICINE

Immunity from Dog Plague

➤ SAVING the lives of many pets is now possible with the development of effective immunization and treatment of leptospirosis, a disease capable of decimating dog populations and an increasingly great health hazard to man.

An antigen capable of conferring immunity to dogs, and probably to man, has been developed in the Hooper Foundation at the University of California Medical Center by Dr. Karl Meyer, director, and K. T. Brunner, researcher.

The scientists also reported that streptomycin and aureomycin are highly effective in the treatment of dogs contracting the disease, which often takes a death toll as high as 85% of the animals afflicted in an epidemic.

Dr. Meyer, whose work was supported by the National Canine Research Foundation, Inc., New York, said that dog owners could protect themselves against possible loss of pets by having their dogs treated thoroughly with streptomycin before they are discharged from kennels or dog hospitals.

Leptospirosis, which is also known as Stuttgart dog plague, is caused by rat-borne spirochete-like organisms of two principal types: *leptospira canicola* and *leptospira icterohaemorrhagiae*. A source of infection for man, dogs, hogs and possibly cattle is contact with objects soiled by the urine of rats.

Dogs infect each other, and also pass the disease along to man by close contact, for example when an animal licks his master's hand at a place where it may be scratched.

In man the infection is known as Weil's disease. A variant is swineherder's disease, which is contracted from hogs. The disease is not nearly so deadly in man as it is in dogs. The victims usually recover after a siege of fever, with jaundice occurring in about 60% of cases.

The disease is found frequently among individuals working under unsatisfactory sanitary conditions, including poultry handlers, slaughterhouse employees, fish workers, junk peddlers and gardeners. It is also prevalent on the Island of Hawaii among the cane field workers.

Dr. Meyer said that although only 229 human cases have been reported in the U. S. in the past 40 years, improving laboratory techniques indicate that the incidence is much greater. For example, 78 cases were diagnosed in the Detroit area alone between 1937 and 1946.

Tests show that significant percentages of dog populations in widely separated areas of the U. S. have survived mild infections. The infection rate in small groups of dogs was 19% in southern California, 34% in San Francisco, 38% in Pennsylvania.

The immunizing antigen was prepared by inactivating leptospira organisms by freezing. Earlier antigens prepared by heat inactivation have been less effective. Dr. Brunner tried the antigen on himself with no adverse effects, so that it apparently is useful in man. The antigen protects only against leptospira canicola. An antigen to the other organism is now being prepared.

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ANTHROPOLOGY

Clue to USSR Character

Swaddling of Russian babies is believed partly responsible for the adamant Russian spirit. For them truth is an absolute, and compromise is inadmissible except as a tactic.

➤ BECAUSE Russian babies are bound with swaddling cloths into a rigid, immobile bundle, the world must contend with a stubborn people whose characters are distorted by these bonds.

That the custom of swaddling infants is one factor determining Russian adult character is the conclusion of the anthropologist Geoffrey Gorer whose analysis of the Russian character is published in a new book, THE PEOPLE OF GREAT RUSSIA, by Geoffrey Gorer and Dr. John Rickman (*Chanticleer Press*).

You were not swaddled. The American baby passes his infancy clothed in loose, light clothing. He can reach out to touch or grasp whatever attracts his attention. He can kick at will. If he is angered at anything, he can flail the air with both arms and legs, can arch his back, can express his emotion with his whole body.

The Russian infant from the moment of birth is tightly swaddled in long strips of material that hold his legs straight and rigid and bind his arms tightly down at his sides.

Although this restriction of movement is enraging to an infant, all the Russian baby can do is to scream and that is soon stoppered by a comforter. After that he can give expression to his bottled up rage only with his eyes—no other part of him is capable of movement.

All non-Russians tend to notice the great expressiveness of Russian eyes, and most Americans know Russians mainly through the song, "Dark Eyes."

At intervals—whenever he is hungry—the baby is taken to his mother, his swaddling taken off and he is caressed and put to the bountiful breast. Thus he goes from one extreme of complete restraint to the other of complete freedom and satisfaction.

In this alternation of treatment, Dr. Gorer sees one of the explanations for those abrupt about-faces for which the Russians are famous in international gatherings where they may change suddenly from a rigid negative attitude to one of smiling assent.

Russian soldiers are also known to switch abruptly from brutality to gentleness. Those who have visited in Russia have been struck by the Russians' endurance of privation alternated with bouts of heavy drinking and extravagant eating.

Teething normally starts while the infant is still swaddled, and this may explain why the Russian's rage is associated with the teeth and with biting off or gobbling up. Russian folklore has a character of a witch baby with iron teeth who devours her parents. Russian propaganda frequently describes their enemies as cannibalistic. They live in the constant fear that their enemies will devour them. It is interesting that Soviet dental service provides false teeth made of stainless steel.

"For several months, at least," writes Dr. Gorer, "the Russian infant experiences intense but relatively undirected rage and fears deriving from his projection of this rage on to the external world; as a result of this he develops a feeling of pervasive though unfocussed guilt."

Dr. Gorer sees an explanation for the "confession complex" in the early religious training of the Russian child. From about the age of five, the Russian child goes to confession. He kneels at the feet of the priest, but instead of giving a free account of his wrong-doings, he is instructed to answer "I am guilty, father" to questions put by the priest accusing him of some sin or other. It is not considered a lie to confess to sins one is not conscious of having committed, but it is considered sinful pride to deny sins of which the confessor accuses one.

The Russian, by tradition, does not understand rule by majority vote, Dr. Gorer points out. To the Russian there is but one truth or right decision on any question and all must comply to it. In the Russian version of the town meeting, the "mir," a member who is in disagreement with the general consent has only one outlet—to separate himself from the meeting. Is this why the Russian delegates are forever walking out of meetings where they find themselves in a hopeless minority?

To a Russian, the leader, whether he is a Czar, Lenin or Stalin, has always been completely idealized by the mass of the population which loyally adheres to the regime. "He is," says Dr. Gorer, "in the most literal sense of the word, superhumanly perfect in knowledge, truth, and foresight.

"He is so idealized that the ordinary person cannot imagine himself thinking or feeling as the leader would do."

It is for this reason that the Soviet representative must always consult with Moscow before making any decision or announcing any course of action.

To the Russian, says Dr. Gorer, compromise is inadmissible except perhaps as a tactic, and there is no possibility of a "loyal opposition." All men of good will must recognize the truth when it is pointed out to them; if they refuse to recognize it, this shows their wicked characters and evil intentions. To accept the decision of the majority, without the appropriate internal convictions, is for Great Russians the abandonment of all honor and self-respect.

The Russian has no concept of relative truths or aspects or versions of the truth. The truth for him is one and absolute. It is a system of interconnected items, arranged in a hierarchy but in such a way that the destruction of one item jeopardizes the whole system.

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GENERAL SCIENCE

U. S. Can Live in Peace With USSR by Firm Policy

➤ IT IS perfectly possible to work out a way of living with Russia indefinitely without war but only through a policy of permanent strength, firmness and consistency.

This is the conclusion of anthropologist, Geoffrey Gorer, on the basis of an analysis of the Russian character made in collaboration with a psychoanalyst, Dr. John Rickman. The analysis together with recommendations for dealing with the Russians is published in a new book, THE PEOPLE OF GREAT RUSSIA, (*Chanticleer Press*).

Dr. Gorer's conclusions are:

"It is useless to try to make friends with, or win the sympathy of, the mass of the Great Russian people, in the hopes of producing transformations of policy. The mass of the people never have had, and (in any foreseeable future) are not likely to have

INSIDE VIEW—The color pattern "frozen" into this plastic model of a human leg bone reveals to Milton M. Leven where fracture might occur if bone were subjected to jarring impact, as in jumping from a height. Concentration of stress lines in socket where bone joins hip shows this to be the danger zone.

any appreciable influence on the policies their leaders adopt. . . .

"No techniques are yet available for eradicating the all-pervasive suspicion which Great Russians, leaders and led alike, feel towards the rest of the world. This suspicion springs from unconscious and therefore irrational sources and will not be calmed, more than momentarily, by rational actions. . . .

"In negotiations with the Great Russians, a successful outcome is most likely if negotiations are phrased in the terms of the most concrete and symmetrical equality: man for man, ton for ton, acre for acre, town for town and so on. In the view of Great Russians, the only alternative to the most rigorous equality is for one of the parties to be completely subordinate, and they always have the fear that they may be forced into the position of absolute weakness.

"Ideological arguments, notes of admonition and disapproval, and the like, are a complete waste of time and energy, as far as the Great Russians are concerned. With the Great Russian concept of truth, *pravda*, it is impossible for them to admit error in any one instance, for that would destroy their whole system of Truth and their self-esteem. . . .

"There is no likelihood of Great Russians voluntarily engaging their country in any form of international organization which might conceivably give to other countries the possibility of constraining them. Consequently, it is a waste of time to discuss, for example, the abolition of the veto in the Security Council of the United Nations. . . .

"Although the Russians will resist every encroachment, while themselves encroaching to the greatest possible degree, there would seem to be no necessity for war between the Western Powers and the U.S.S.R. The one situation which might evoke war (apart from the Western Powers 'compressing' Russia) would be if the Western Powers manifested such weakness, or such alternations between strength and weakness, that the Russians would feel compelled to advance to such a degree that the Western Powers would feel that the menace was intolerable."

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ENGINEERING

Photo-Plastic Puts "X" On Strains in Machines

➤ MACHINE parts made of transparent plastic, instead of metal, are coming into wide use by technicians to let them see with their eyes the results of operation actions.

This so-called photo-plastic, first announced a year ago, is now being employed in gun factories, naval laboratories, airplane plants, arsenals and universities in the design of stronger machinery and equipment. The three-dimensional models cut from the plastic enable scientists to get a "portrait in color" of the strains encountered in tools, machine parts and other objects.

The plastic used is a modified form of Fosterite, a tough, waterproof material developed by Westinghouse scientists during World War II to seal radio and radar parts against moisture damage. The new material was developed by Milton M. Leven and Herbert F. Minter, both of the Westinghouse Research Laboratories. It can be cast in chunks from ten to 20 times larger than any other resin formerly available for strength studies, it is claimed.

One of the major uses of this plastic is in the design of breech blocks for big guns. To understand the terrific stresses these parts undergo during firing of the gun, an exact three-dimensional model of the block has been built and "loaded" to simulate the stress.

When frozen into the material and then viewed through special polarized light, the stress pattern appears as a series of varicolored lines. These tell the scientist where the major stresses are located, in which direction they are acting and just how great they are.

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Both New York and Pennsylvania have more acres of land in *crops* than all the New England states combined.

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MEDICINE

Cancer Hospital Opens

Ewing Hospital in New York will be devoted to the research task of better treatment of cancer. Patients will be treated, and the search for a cure will continue.

➤ THERE is new promise that there will be fewer incurable, hopeless so-called "terminal" cases of cancer in the years to come.

A $6,000,000-pile of bricks, concrete, tile and stainless steel, paid for by the people of New York City, was dedicated in New York to the research task of better treatment of the disease that takes the lives of one out of every five New Yorkers. This new 275-bed hospital is named for Dr. James Ewing, a pioneer in cancer research at the famous Memorial Center in which the new Ewing Hospital is integrated.

Although the new Ewing Hospital is owned and operated by the city, it will function as a part of the group of research hospitals and institutions which include the Memorial Hospital, Sloan-Kettering Institute, Cornell Medical College and the New York Hospital.

Suffering will be eased within these bright new walls. But more important, the great fight to learn more about malignant diseases and their treatment will be advanced.

Dr. C. P. Rhoads, director of the new hospital and of Memorial Center, is confident that many of the cancer patients now called hopeless will be checked by new techniques and even "cured" in the sense of staying alive for five years or more.

In the past three years techniques have been developed at Memorial Hospital that promise 15% to 20% such "cures" in pelvic cancer that previously would have been labeled incurable. One of the tasks of Memorial Center, including the new Ewing Hospital, is to give scores of physicians experience in new methods so that they may treat cancer in general hospitals and private practice throughout the world.

The more extensive peaceful use of atomic energy, Dr. Rhoads said at the dedication, is to destroy cancer. Suitable patients are being sent regularly for certain forms of atomic treatment from the Memorial group of hospitals to Brookhaven National Laboratories, where a new atomic reactor has just been put into operation.

Even some of the poisons developed for chemical warfare are now employed in the control of cancer. The improvement and extension of methods of warfare are related to cancer research.

"The training of disease-producing viruses to pursue and to destroy cancer," said Dr. Rhoads, "is in principle and method their training to destroy our enemy, his animals or his food crop. To develop for peaceful purposes these weapons of war, and the protection against them, is the function of our Memorial Cancer Center."

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CANCER CENTER—A view of the new James Ewing Hospital, First Avenue and 68th Street, dedicated and opened by Mayor O'Dwyer on August 23, 1950. The hospital represents a cooperative undertaking between the Department of Hospitals, City of New York, and Memorial Center for Cancer and Allied Diseases.

CHEMISTRY

Electrical Fields Distort Atoms in Catalytic Action

➤ SOME of the mystery of catalytic action has been solved by Dr. W. A. Weyl of the department of mineral technology of Pennsylvania State College.

Catalysts speed up chemical processes by their mere presence, without taking any part in the reaction, and are widely used in oil refining and other industries.

Electrical fields inside the atoms, which pull and distort the shape of atoms near the surface, and so make them act in an unusual way, are responsible for the catalytic effect, according to Dr. Weyl's interpretation. Some of the unusual colors of crystals and certain trade secret processes can be explained by the same action of warping and crowding of surface atoms.

One such is the process of swabbing the glass in mirror manufacture with a solution of tin salt, which is thoroughly washed off before the silver is applied. According to Dr. Weyl's theory, enough deformed tin atoms cling to the surface of the glass to present on their free side a metallic film to which the silver will become attached.

The new theory also accounts for the so-called poisoning of catalysts by certain types of compounds. Poor materials can be improved and good ones made better for catalytic purposes as the theory of their action becomes better known. Dr. Weyl presented his theory at a recent meeting of the New York Academy of Sciences. His work is sponsored by the Material Branch of the Office of Naval Research.

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AERONAUTICS

Plane's Detachable Cargo Compartment Is Versatile

➤ THE detachable box-car-size cargo compartment of the new Fairchild military plane, which has now made its maiden flight, is suitable for many uses.

It might be fitted out as a surgical operating room to be landed all ready for use in advanced combat areas. Air Force medical men consider this feasible but say it would be costly because all the equipment and instruments would have to be specially designed and made. Although some light weight equipment is now on

hand, no budget planning for an airborne operating room has yet been done.

With proper equipment, it could serve also as a forward photographic laboratory to give combat units quick information from aerial photographs. Outfitted as a kitchen, it could provide hot food for fighting men.

The advantage of this new airplane is that it can deposit its cargo compartment, which is bigger in bulk than the plane itself, wherever needed and then take off to pick up another compartment to carry it where wanted.

In its functions the plane is somewhat like the powered units that haul giant trailers on highways. When the tractor unit reaches its destination for loading or unloading, it is transferred to another trailer to start on another highway trip.

In general appearances while in flight, this new plane, built in Hagerstown, Md., by Fairchild Engine and Airplane Corporation for the U. S. Air Force, is similar to the well-known Fairchild Packet. Its cargo compartment fits snugly to the belly of the long slim plane itself, appearing as an integrated unit.

The carrier plane, as the powered unit might be called, has wing-mounted engines, and struts extending to its landing gear long enough to permit it to straddle a cargo compartment on the ground. When the compartment is attached, the plane takes it off through the air.

Wider use of the cargo compartment is promised with a helicopter carrier under development by the Piasecki Helicopter Corporation, Morton, Pa., according to a Fairchild announcement made within the year. The idea is that the helicopter would be able to straddle a compartment deposited on a nearby airfield and carry it into rough country where airplane runways do not exist but where fighting men need equipment and supplies.

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MEDICINE

Anti-Disease Bill Passes

The Omnibus Research Bill which declares total war upon disease has passed. Two new research institutes will be established.

➤ THE U. S. Public Health Service is set to fight total war against disease, now that the so-called Omnibus Research Bill has been signed by President Truman and become law.

As a result, your heart may beat longer, your joints may never stiffen with rheumatism, your children may never know the pain of toothache, you may be spared the anguish of seeing a child or grandchild forced to grope through life with blind eyes or chained to a wheel chair because of some disease like multiple sclerosis.

The new law authorizes the federal health service, through its National Institutes of Health, to attack disease on a broad front ranging from cancer and heart trouble to blindness, deafness and some of the mystery diseases in which nerves, muscles and bones fail to work properly.

The hopes and prayers of millions of sufferers from multiple sclerosis, cerebral palsy, epilepsy, rheumatism and arthritis, are one step nearer fulfillment because of the broadened range of research and training which will become possible if funds are appropriated to put the provisions of this law into effect.

Specifically, two new national research institutes are authorized. These are: 1. National Institute on Arthritis, Rheumatism and Metabolic Diseases, and 2. National Institute of Neurological Diseases and Blindness. But the new law also authorizes the Surgeon General of the Public Health Service to establish one or more additional institutes dealing with other diseases, for example, poliomyelitis and leprosy, whenever he considers these needed to improve further the health of the American people.

At the present the Surgeon General, Dr. Leonard A. Scheele, does not think any additional institutes are needed or will be in the immediate future. The rheumatism institute includes "metabolic diseases" which, he explained, takes in a wide variety of chronic diseases such as diabetes and various glandular disorders. Deafness, he added, might well be included in the field covered by neurological institute.

Each of the two new institutes will have its own advisory council, just as the existing institutes now have. Each of the councils, new and old, will in the future have half its membership made up of lay persons and the other half of doctors or dentists or other scientists.

Before passage of the new law, there were six National Institutes of Health dealing with cancer, heart diseases, dentistry, mental health, experimental biology and medicine, and microbiology.

Research into rehabilitation for patients already afflicted with crippling and disabling diseases will be pushed as part of the program of the new neurological institute.

While the new and old institutes will be primarily devoted to attacks on diseases through research into causes, treatment and prevention, some of their work will be carried on through training of future scientific specialists and some will be devoted to fundamental research of the kind that often does not look immediately practical. The value of this kind of research was shown during World War II and, more recently, in the discovery of cortisone for arthritis.

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FIRST DETACHABLE FUSELAGE—The giant detachable cargo compartment in a military transport allows for faster ground handling and loading times. The compartment can also be fitted out as a surgical operating room or a forward photographic laboratory for advanced areas.

MEDICINE

Starvation Affects Heart

The heart grows smaller when food intake is reduced to that of a semi-starvation diet. At the end of six months the subjects showed the signs of famine victims.

➤ WHEN a man is on a semi-starvation diet, his heart grows smaller.

In the Minnesota Experiment, made at the University of Minnesota in Minneapolis with 32 conscientious objectors during World War II, X-ray measurements of heart size showed that the heart volume decreased 17 percent during six months of semi-starvation.

These findings, contrary to statements "in every major textbook of physiology since 1900," are reported by Drs. Henry Longstreet Taylor and Ancel Keys in the journal, SCIENCE (Aug. 25).

The brain, on the other hand, and the skeleton and the proteins of the blood serum remain almost intact during semi-starvation.

Fat, muscle, liver and skin, like the heart, undergo large losses.

But although the heart grows smaller, the work done by it during starvation decreases by about half. This is a protective change that can be considered an adaptation of the body to the stress of starvation.

The way in which the body adapts to a starvation diet, however, is quite different from the way it adapts to such stresses as high-altitude living, heart disease or an increase in temperature of the environment, the Minnesota scientists point out.

Much of the adaptation during semi-starvation is, they state, "an automatic consequence of the use of the body itself as fuel for the metabolism. The life of the organism is prolonged or maintained closer to normal than would otherwise be the case by the rather desperate expedient of reducing the mass activity of the organism. This mechanism, it seems to us, is entirely passive and produces major limitations and stresses of its own."

In contrast, the man who has to live at a high altitude where the atmosphere has a lower partial pressure of oxygen, achieves a more positive adaptation.

"He reduces his demand for high rates of oxygen supply by reducing the intensity of physical work, but does not alter his oxygen use or rate of life at rest or with moderate activity. Adaptive mechanisms provide oxygen to the body in normal amounts for all but extreme exertion. The changes include an increase in red (blood) cell concentration, a higher rate or pulmonary (lung) ventilation and a change in the acid-base balance of the blood."

The man who travels from a cool to a hot environment, the scientists state, adapts to this stress by a more efficient elimination of heat from the body through an improved performance of heart and blood vessels and, apparently, through a reduction in basal heat production. Safety with a high rate of sweating is assured by a change in the composition of the sweat.

The men in the Minnesota Experiment lived for six months on a diet of potatoes, cabbage, turnips and cereals with only a few grams of animal protein a week. The diet provided an average of 1,570 calories daily, or slightly less than half the 3,492 calories the men consumed each day of a three-months control period before the semi-starvation diet.

At the end of six months of this diet, the men had lost 24% of their body weight and showed the classical signs and symptoms of famine victims, such as dropsy, anemia, disturbed heart and kidney function, weakness and depression. They lost strength and endurance to a marked degree, and said they felt "as if they were rapidly growing old. They felt weak and they tired easily. They moved cautiously, climbing stairs one step at a time and obviously reduced unnecessary movements to a minimum."

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MEDICINE

Powerful Drug, Tapazol, Treats Thyroid Trouble

➤ TRIALS of a new drug for treating certain kinds of thyroid trouble which is 25 times as powerful as one of the anti-thyroid drugs now used are reported by Drs. William S. Reveno and Herbert Rosenbaum of Harper Hospital and Wayne University College of Medicine, Detroit, (JOURNAL AMERICAN MEDICAL ASSOCIATION, Aug. 19).

The new drug is called tapazol, short for l-methyl-2-mercaptoimidazole. It is not yet on the market for general use. The Detroit doctors got their supply from the Lilly Research Laboratories.

Because it has been tried on only 18 patients for six months, the results, though promising, are considered preliminary. It was used for the kinds of thyroid trouble in which the gland is overactive, such as cases of toxic goiters.

It is "fully as efficient as thiouracil and propylthiouracil" and 25 times as potent as the latter drug. It differs chemically from these well known anti-thyroid drugs in having a five-membered rather than a six-membered ring structure.

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AERONAUTICS

Eight-Bladed Propellors For Turbo-Prop Engines

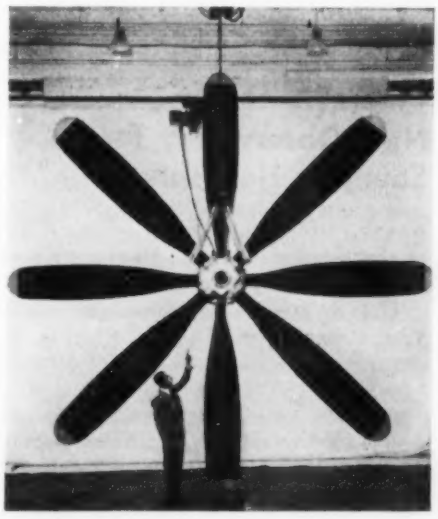
➤ EIGHT-bladed giant propellers over 19 feet in diameter, said to be the world's largest and most powerful, were revealed in Caldwell, N. J., by the designer and builder, the Curtiss-Wright Corporation.

They are designed for the U. S. Air Force for use on speedy planes equipped with gas turbine engines, turbo-props of 10,000 to 15,000 horsepower. They are dubbed the "Octoprop."

The Octoprop dwarfs in size and performance all previous propellers for either reciprocating or turbo-prop engines, officials state. The propeller is a dual-rotation type. Two sets of four blades whirl in opposite directions on a specially geared shaft. They give thrust enough to lift a fully-loaded plane of the giant four-engined DC-6 type.

The blades of the Octoprop may be feathered, or turned at an angle to reduce drag in the event of engine failure. They may be reversed in action for use as an aerodynamic brake to shorten landing runs. Among other features are automatic constant speed operation and provision for heated air de-icing. The eight blades are of hollow steel construction.

Science News Letter, September 2, 1950



"OCTOPROP"—The eight-bladed, 19-foot diameter, dual-rotation propellor dwarfs William E. Burns. Designed for an engine of 10,000 to 15,000 horsepower, it has a rated thrust in excess of the force required to lift a 4-engined transport of the Douglas DC-6 type off the ground with maximum load.

CHEMISTRY-MEDICINE

Change in Cell Chemistry May Be Step in Cancer

➤ A CHANGE in fundamental cell chemistry which might be a first step toward the development of cancer has been discovered by Drs. Antonio Cantero, Roger Daoust and Gaston De Lamirande of the Montreal Cancer Institute and Notre-Dame Hospital in Montreal, Can.

During the transition stage when a cell is becoming cancerous, enzymes which break down the acid in the cell's nucleus behave differently than they do after the cell has become cancerous, the Montreal scientists find.

They worked with white rats that had been fed a diet of cooked polished rice and an azo dye. This diet caused an irreversible liver cirrhosis which the scientists consider a sign that cancer is going to develop. The enzyme activity of these pre-cancerous rat livers increased progressively up to the 90th day the rats were on the special diet. Then the enzyme activity decreased progressively for the rest of the 150 days of the diet.

Previously it has been shown that the nucleic acid these enzymes affect is changed in cancer. Whether the change is a first step in producing cancer or merely accompanies the development of cancer is not yet definitely known. These studies however, were made of nucleic acid in normal and cancer cells. The studies of the Montreal scientists, reported in the journal, SCIENCE (August 25), were made on cells during the transition stage between the normal and cancerous states.

Science News Letter, September 2, 1950

ASTRONOMY

New Observatory for Southern Hemisphere

➤ A NEW astronomical observatory will be established in Australia, it was announced recently in New Haven, Conn.

A joint venture of three universities, Yale, Columbia and Uppsala, Sweden, the observatory will located on Mt. Stromlo, near Canberra, capital of Australia.

The two American universities now operate a joint observatory, the Yale-Columbia Southern Station, at Johannesburg, South Africa. This will be given up and the equipment moved to the Australian research center.

Plans for the cooperative arrangement were made by Dr. Dirk Brouwer, director of the Yale Observatory, Dr. Jan Schilt, director of the Rutherfurd Observatory at Columbia and Richard van der Riet Woolley, director of the Commonwealth Observatory, who is visiting the United States.

Yale and Columbia will install a 26-inch photographic refractor telescope in the new observatory. The Australian government will construct the dome to house this instrument and will supply other equipment, including a 74-inch reflector telescope and a Schmidt-type telescope.

The astronomical research center is expected to be ready for use by Jan. 1, 1952.

Hindrance of observations by city lights and smoke from industrial plants in Johannesburg is one of the reasons for moving to a new location, Dr. Brouwer stated. Mt. Stromlo is in an area where industrial or residential development has been forbidden by act of the Australian Parliament.

Science News Letter, September 2, 1950

ENGINEERING

Silica Glass for Small High-Wattage Lamps

➤ THE only new development in glass making since glass melting began many years ago is a process now used in producing new silica glasses with properties approaching fused silica, the Illuminating Engineering Society was told in Pasadena, Calif.

These products, called Vycor brand 96% silica glasses, can be used to make high wattage incandescent lamps in small envelopes, W. W. Shaver of Corning Glass Works, Corning, N. Y., stated. Also, in germicidal lamps, they increase efficiency because they transmit a larger percentage of ultraviolet rays.

The first steps in making these alkali-borosilicate glasses, as they are also called, are conventional melting followed by blowing, pressing or drawing processes. But the products are turned out in oversized shapes.

After a heat treatment they are immersed in a dilute acid bath and soluble materials are leached out. In the heat treatment the glass separates into two phases, one of which is rich in boric oxide and acid soluble while the other is practically 96% silica.

New photochemical lamps, developed particularly to meet the operating conditions of modern whiteprint machines, were described at the same meeting by L. E. Barnes of Westinghouse Lamp Division, Bloomfield, N. J.

These new lamps have higher ultraviolet output and more uniform output because of reduced sensitivity to drafts. They have longer life and their life is practically independent of the number of times the lamps are turned on.

In these lamps the Corning Vycor glass is used, being cheaper than quartz and more efficient than glasses formerly employed. By means of a new electrode sealing process, the need of an exhaust tip is eliminated. The new glass permits a reduction in bulb diameter, thereby reducing sensitivity to drafts.

Science News Letter, September 2, 1950

IN SCIEN

ZOOLOGY

Rare Birds at Bronx Zoo

➤ SOME of the rarest birds ever to come out of South America—including a long-wattled umbrella bird, an equatorial cock of the rock, and a series of brilliant-hued Andean humming birds—went on exhibition recently at the Bronx Zoo in New York.

They are part of a collection by Charles and Emy Cordier of the New York Zoological Society. Some of the humming birds, inhabitants of high reaches of the Andes Mountains in Ecuador, are believed never to have been exhibited alive before.

The rare long-wattled umbrella bird has a bright red throat pouch which blows up to more than a foot in length and four inches in diameter. When first put into a glass-fronted cage with a cousin the eastern umbrella bird, the new inmates immediately tried to fly through the plate glass. The cage had to be whitewashed until the birds learned the limits of their strange new world.

Science News Letter, September 2, 1950

AERONAUTICS

Automatic Parachute Opens at Proper Altitude

➤ A PARACHUTE that opens automatically at the proper distance from the ground, developed at the Wright-Patterson Air Force Base in Dayton Ohio, promises to eliminate much of the hazard of dropping from speedy planes and high altitudes with open chutes.

The parachute "brain" contains a timer, which is set usually to permit an interval of five to seven seconds between release and opening. It contains also an aneroid element, such as used in barometers, set to open the chute at an elevation of 5,000 feet above the earth. The parachuter has a free-fall until this proper height above the earth is reached.

The parachute requires only that the pilot get out of the plane and pull a handle connected by cable to the automatic release. From there on, the automatic release takes over, opening the chute after the airman has fallen a safe distance. It prevents accidents that follow if a pilot fails to pull a hand ripcord at the proper time or if he is prevented by a blackout from pulling it at all.

The parachute itself is the same size as earlier types but is 30% lighter and its tearing strength has been increased 100% by a special rip-stop weave.

Science News Letter, September 2, 1950

SCIENCE FIELDS

MEDICINE

Warn against Overdose Of Ergot for Headache

➤ ERGOT is a "most potent and effective" drug for relieving migraine headaches but overdosing with it must be avoided, Drs. Marvin Fuchs and Lester S. Blumenthal, of George Washington University Medical School, Washington, D. C., warn in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 26).

They base their warning on two cases. In one "alarming symptoms," including massive vomiting, pain around the heart, palpitations, numb and cold extremities and blue lips and nails, developed 30 to 40 minutes after taking two tablets of cafergot. This is an ergot and caffeine preparation. The patient recovered, but he was unable to get out of bed for 24 hours because of prostration. This case is believed the first in which bad effects followed the use of cafergot.

The other case, in which the patient's heart was affected, is the first known report of such toxicity from another ergot preparation, dihydroergotamine.

Migraine headache sufferers are usually resistant to the harmful effects of ergot, the Washington physicians point out. However, they warn, migraine does not give immunity to ergot poisoning.

Malnutrition, from protein and vitamin lack, and high blood pressure even without detectable artery or kidney complications, are conditions which should make doctors extra cautious in giving ergot preparations, the Washington physicians state.

Science News Letter, September 2, 1950

MEDICINE

Vampire Bats Carry Rabies In Tropical Countries

➤ VAMPIRE bats, legendary terror of the tropics, now have another curse against their name. Like mad dogs and foxes in temperate zone countries, blood-sucking bats are transmitting rabies.

The modern-day fight against the vampires was described by Dr. James H. Steele, chief veterinarian of the U. S. Public Health Service's Communicable Disease Center at Atlanta, Ga., in a paper at the annual meeting of the American Veterinary Medical Association in Miami Beach, Fla.

Rabies is almost sure death to both man and animals unless serum is given before symptoms of the disease appear. In the United States, Dr. R. B. Phillips of Cordele, Ga., reported, cows are becoming more susceptible to rabies than dogs. In one section of Georgia last year, he said, rabid foxes killed about 360 cows, horses and mules. Dogs, although highly susceptible to the dread disease, were protected by vaccination.

Another cattle disease called anaplasmosis, which is like malaria in humans, now costs U. S. farmers about $5,000,000 a year, Dr. Paul L. Piercy of the University of Georgia told the convention.

Originally found only in the Deep South, anaplasmosis now has spread to half of the 48 states. It is carried by ticks, flies and mosquitoes, and may be transmitted by man by the use of unsterilized surgical instruments in dehorning or vaccinating cattle. Cows that recover from the disease may be carriers of it for the rest of their lives. No satisfactory treatment of the disease has yet been found.

Science News Letter, September 2, 1950

GENERAL SCIENCE

Direct Handling of Deferment Appeals

➤ RESERVE officers will soon be able to appeal directly to the Pentagon for deferment if they are in jobs they or their employers consider essential, Science Service learned.

The Army, Navy and Air Force are setting up an appeals mechanism headed by an officer of colonel or general rank in each service to which reserve officers subject to call may take their cases directly instead of going through channels.

The nation's top scientists see this as a step ahead in the task of conserving our vital supply of scientific personnel. They consider that the recently announced categories in which officers and men will be deferred from active duty was not sufficient. The time between being called up and reporting for duty is not long enough to get a proper decision at a local level.

Also, with decisions being made by local draft boards, the tendency is to put a man in service rather than to consider whether he would be more useful to the nation in his present civilian job. Until the appeals mechanism is set up, reserve officers must make their appeals through the chain of command where they are likely to be stymied.

The scientific world, however, does not consider the impending appeals mechanism enough. Scientists are still plugging for a scheme under which the entire scientific manpower picture of the nation will be assessed.

Scientists of draft age and in the reserves would then be assigned to the places in which they could do the nation's defense effort the most good, whether in uniform, in government laboratories, in private industry or in the colleges and universities.

Science News Letter, September 2, 1950

METALLURGY

Thorium, Atomic Energy Element, Found in India

➤ THORIUM occurs in the monazite sands in the Gaya district and in other parts of India, it is reported in a series of investigations on radioactive minerals of India by S. K. Nandi and D. N. Sen of the University College of Science and Technology in Calcutta, India.

Thorium is the only natural element besides uranium from which fissionable materials for the A-bomb can be made. Crystals of the thorium mineral occur in several places in India, associated with pitchblende, the usual ore of uranium, according to the Indian scientists.

The mineral is an ortho-phosphate of the rare element cerium, and contains 12% of thorium combined partly as phosphate and partly as silicate. A small fraction of a per cent of uranium present in the monazite sand allowed the age of the mineral to be determined as 803 million years, and assigned it to the Pre-Cambrian geologic age.

The researches are published in the JOURNAL OF SCIENTIFIC AND INDUSTRIAL RESEARCH (June).

Science News Letter, September 2, 1950

AERONAUTICS

Nautical Miles Will Replace Statute Miles

➤ KNOTS and nautical miles will replace miles-per-hour and statute miles in aircraft communications in the United States after July 1, 1952, it was revealed recently by D. W. Rentzel, head of the U.S. Civil Aeronautics Administration, Washington, D.C.

This will be in accordance with the standards established by the International Civil Aviation Organization, of which the United States is one of the 50-odd members. It also will put civil aviation in step with the U.S. military forces which in 1946 adopted knots and nautical miles as standard for all aviation operations.

A nautical mile is 6080 feet, compared with 5280 feet in a statute mile. Basically, it is a sixtieth of a degree, or one minute, on the arc of a great circle of the earth. Knots express the number of nautical miles traveled in an hour. A speed of 20 knots means traveling at 20 nautical miles per hour. A speed of 91 miles per hour is the same as 79 knots.

The recommendation of the International Civil Aviation Organization relative to the world-wide adoption of knots and nautical miles is one of several steps taken by the group to promote international transportation and make aviation communications easier to understand by pilots from all parts of the world by the use of universal terms.

Science News Letter, September 2, 1950

CHEMISTRY-BOTANY

The Big Itch Bites the Dust

Deadly sprays are the weapons in an all-out attack against the terrible trio of poison ivy, oak and sumac. "Leaves of three, let it be" is still sound advice.

By SAM MATTHEWS

➤ DEADLY chemicals armed an all-out attack this summer against an innocent-looking green leaf whose unmistakable trademark is an intolerable itch.

The leaf belongs to the clan *Toxicodendron*—the terrible trio known as poison ivy, poison oak and poison sumac. In round figures, these three plants blistered half a million Americans this vacation season.

Their profusion in fields and woods, along fence rows, rock walls and hedges, in country lawns and city gardens, seems almost in outright defiance of the human race. For generations, men could do little about the pests but scratch in angry impotence. Now revengeful victims have weapons with which to fight back.

Three new chemicals have joined man's battle in the last decade: ammonium sulfamate, 2,4-D, 2,4,5-T. There are older killer compounds: ammonium thiocyanate, powdered borax, carbon disulfide, coal-tar and petroleum oils, sodium chlorate and sodium arsenate.

Sulfamate Most Effective

Ammonium sulfamate, widely marketed by du Pont under the trade name Ammate, is perhaps the most effective weapon yet developed against poison ivy. It begins to wilt the leaves within 24 hours, will kill the entire rootstock if properly applied. The U. S. Department of Agriculture recommends ammonium sulfamate as the best poison ivy killer to use in frequented areas such as school yards, playgrounds and picnic areas.

Originally developed as a wartime biological warfare agent, 2,4-D is one of the so-called "plant hormones." It is not a quick killer, nor is its similarly numbered cousin, 2,4,5-T.

Sprayed on poison ivy, at first these compounds seem to have little effect. The shiny green leaves take from three weeks to a month to completely die. These inexpensive chemicals are excellent killers, however, and are best for use in places where contact by humans or dogs is not normally expected.

Be careful with both ammonium sulfamate and 2,4-D. Ammate kills any plant it actually touches; 2,4-D, although it will not harm grassy growth, will ruin broad-leaved plants such as tomatoes, potatoes and many flowers if the wind carries the chemical into your garden—or your neighbor's. Be careful to wash out your sprayer thoroughly after using these weed killers.

Spray in the morning of a windless, hot and humid day. Life processes in plants will be moving at top speed then. The chemicals will be absorbed quickly and will be carried to all parts of the plant, even though they originally hit only a few leaves of the vine.

Several Sprayings Needed

Some new growth must be expected after the first spraying. Two to three additional treatments will be required the first year, followed next spring by a mop-up campaign.

There is still no substitute, however, for quick recognition of the poison plants to keep your skin clear of Toxicodendron's trademark. Pay heed to the old adage, "Leaves of three, let it be."

Poison ivy and poison oak grow as long, twisting root-vines, sometimes running just under the surface of the ground, sometimes climbing tree trunks, walls, even the sides of houses. If beneath the ground, the shoots appear as low, erect shrubs.

These two plants flourish everywhere—in deep woods where the soil moisture is plentiful or on dry, exposed hillsides. The compound leaves always grow in sets of three from the same point on the vine, appearing glossy green on top, lighter underneath. When the rootstock climbs above ground, it sprouts hundreds of tiny aerial tendrils. In fall and winter, poison ivy and poison oak carry dull white berries.

Poison sumac is a coarse woody shrub or small tree. Like ordinary sumac, it touches the woods in fall with brilliant red-orange or russet. Poison sumac, however, grows only in wet, acid soil around swamps and bogs. Unless you spend your summer near such a place, there is little likelihood of running into it.

Once poisoned by these plants, there is no quick cure known. There are dozens of remedies offered. Most of them offer relief from itching, although individual sufferers react differently to different preparations. In all but the most severe cases, blisters will dry up and disappear by themselves in 10 days to two weeks.

Tannic Acid Treatment

The U. S. Public Health Service recommends a 10% alcoholic solution of tannic acid. Rub vigorously with gauze soaked in the solution until the tops of the blisters rub off. Repeat three or four times at six-hour intervals. This treatment will sting.

In any severe case of poisoning, self-treatment is not a good idea. The safest procedure always is to see your doctor.

The poisonous agent in the sap of poison ivy, oak and sumac is a substance known as urushiol. Its action on the skin is now recognized as a form of allergy. Individuals vary widely in reaction to it; but doctors believe there is no such thing as a completely immune person. You may never have been affected by poison ivy, and suddenly come down with a severe attack.

ITCH PRODUCERS—Leaves of poison sumac (left) are divided into odd-numbered series of leaflets, from seven to 13 in a group. Bright orange in spring, they turn dark green in summer, then red-orange or russet in the fall. Most poison ivy vines (right) develop tiny white blossoms in the spring.

DESTROYING PEST—Poison ivy should be sprayed three or four times during the summer.

Urushiol is so potent that as little as 1/60,000 of a grain of it (about .00000004 of an ounce), when dissolved in olive oil and rubbed on the skin, will cause mild poisoning.

Plants which carry this evil substance are not known in Europe. There are Asiatic sumacs, however, whose sap is highly poisonous. This sap has been used as a shellac.

A story is told of a zealous customs inspector who opened a heavy can brought in by a Chinese importer. The importer said the stuff was shellac, but the inspector said to himself, "A-ha, opium!" He took the sticky black substance to the laboratory, spread it over himself liberally while analyzing it, and for the next month was laid up with one of the worst cases of sumac poisoning on record.

Science News Letter, September 2, 1950

MEDICINE

Resentment Causes Hives

➤ RESENTMENT is a cause of hives, it appears from studies of 30 patients reported by Drs. David T. Graham and Stewart Wolf of the New York Hospital and Cornell University Medical College (JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Aug. 19).

The patients got attacks of hives when they felt they were being unjustly treated and could not fight back nor avoid the unfair situation.

"Taking a beating" (unjustly) is the way they described it, and their blood vessels behaved as they would if the patients had actually been receiving blows.

The doctors' studies showed that the hives resulted from extreme dilation of the small blood vessels in the skin which occurred as part of the patient's reactions to the situation.

Although these patients sometimes felt hatred of others or anxiety about various situations, it was always resentment that brought on the attack of hives. In some cases of flushing of the skin in embarrassing social situations, questioning revealed that there was some resentment mixed in with the embarrassment.

The resentment was usually felt toward a wife, husband, parent or other close relative. The patient felt "There was nothing I could do," although the doctors often could see how the patient could have fought back or avoided the unjust treatment.

Science News Letter, September 2, 1950

PHYSICS

Arrangement Irregularities Govern Material Strength

➤ THE strength of materials may depend upon the irregularities in atomic arrangement in solids, it is believed in New Brunswick, N. J., by scientists of Rutgers University.

In research work seeking new basic information dealing with the irregularities of atomic arrangement, they are using X-rays to produce more accurate and complete pictures of the irregularities than ever produced before, it is claimed.

The work is sponsored by the Office of Naval Research. The scientists on the project are Dr. Alfred J. Reis and Sigmund Weissman. Their work is based on long-known knowledge that the physical properties of metals, ceramics and other industrial materials must be intimately connected with the arrangement of atoms.

Science News Letter, August 19, 1950

On This Week's Cover

➤ TAILORS spend not only winter days but sweltering summer days cutting and fitting sleek, tailored overcoats—thick, asbestos-lined "overcoats" for steam turbines. For the turbines need overcoats no matter how hot the weather, to prevent loss of heat from the temperature steam that makes most of the nation's electrical power.

No drape shape will do for a turbine. Even the curve of the cross-over pipe of the turbine must be smoothly jacketed as shown on this week's cover of SCIENCE NEWS LETTER. The "interlining" of the turbine's overcoat is a thick blanket of asbestos and glass fiber. Like a satin bedcover, the sections of "blanket" under the canvas are quilted and tufted to keep the stuffing from bunching or shifting. But turbine tailors sew with steel wire and tuft with steel washers.

In making some of the world's largest clothing, the Steam Division annually uses some 60 miles of wire "thread"; 7,500 square yards of asbestos cloth; and more than 64,000 pounds of glass fiber.

Science News Letter, September 2, 1950

GENERAL SCIENCE

Giannini Sues Government

The Giannini Company has filed suit against the U. S. Government for compensation to Dr. Fermi for use of his patent on atomic energy processes.

➤ THE question of how far one individual may patent the laws of nature will probably be reopened in connection with the suit filed against the U. S. Government by the G. M. Giannini Co., of Pasadena, Calif., for compensation to Dr. Enrico Fermi for use of his patent on atomic energy processes.

The U. S. Patent Office, having granted the patent to Fermi and his co-workers in 1940, has no further jurisdiction over the matter. It is up to the Court of Claims to determine whether it has jurisdiction in the case, and, if so, whether Dr. Fermi should receive compensation for use of his process for non-military purposes, or whether his claims are too broad. The claims specified use of neutrons for production of radioactive isotopes two years before it was known that they would produce a chain reaction.

The patent which is the basis for the $10,000,000 suit was issued July 2, 1940, on an application dated 1935. A similar patent was applied for in Italy in 1934. The inventors are listed as Enrico Fermi, Edoardo Amaldi, Bruno Pontecorve, Franco Rasetti and Emilio Segre of Rome, Italy, and it was assigned to the Giannini Co., at that time in New York City.

The patent states that it relates to production of isotopes by reaction with neutrons, especially for production of artificial radioactivity. It specifies use of low energy neutrons instead of charged particles to produce nuclear reactions, and mentions hydrogen, beryllium, carbon, silicon and lead as materials which will slow neutrons down to the energies needed. This is the description of the atomic pile, in which carbon, in the form of graphite bricks, controls the neutrons. Fermi's specification for producing neutrons is the same as that used today, a mixture of radon and beryllium.

The form of the atomic pile planned by Fermi, however, was made of paraffin or other material rich in hydrogen, or else a tank in which material to be irradiated was to be dissolved in water, either the usual kind or "heavy water." While this kind of pile has not been used on a large scale, experimental work has proved it to be efficient.

Fermi's idea of using so-called slow neutrons proved the key to the two successful processes for atomic energy, fission of uranium 235 and production of plutonium.

Science News Letter, September 2, 1950

GENERAL SCIENCE

Draft by Occupation

➤ A RADICAL new method of drafting men for the armed forces whereby they might be called up by occupation instead of by order number is being quietly pushed through Congress by the administration, Science Service has learned.

Under the new system, if the army wants 100 automobile mechanics, it can call them up directly instead of hoping to get them in a general draft.

The authority to do this is contained in a new bill presented August 22 to a subcommittee of the Senate Armed Services Committee. It provides that the President can order the registration and drafting of "professional, technical, scientific, specialist and other occupational categories."

It is the "and other categories" phrase under which the automobile mechanics—or cooks or truck drivers—could be drafted directly.

The new bill was presented to the subcommittee at a meeting which discussed the Gurney bill that would give the President the power to draft doctors and dentists. Various amendments to this bill to include the registration of all scientific personnel were presented but it looks now as though the Gurney bill will be confined to members of the healing arts professions. The new bill will take care of scientific personnel "and other categories."

Scientists are worried that the call-up of their colleagues under the new bill would be administered by the present Selective Service System which, they claim, does not have the competence to do the job, either on the national or local level. A top scientist, perhaps Dr. Vannevar Bush or Dr. Karl T. Compton, will shortly present to the President a proposal for a Scientific Selective Service Board to register both men and women with scientific skills and to call them up if necessary.

However, National Security Resources Board officials who wrote the new overall registration bill claim that authority to draft men by occupations would be taken away from the Selective Service System under the language of the bill and placed in the hands of the President. It is possible that the President would designate the NSRB as the agency to handle this occupation draft.

Science News Letter, September 2, 1950

VETERINARY MEDICINE

Animal Diseases Which Attack Man Studied

➤ UNDULANT fever, known to be transmitted in unpasteurized milk, is also widely carried by the meat from hogs, cattle and goats which have brucellosis, it was reported in Miami Beach, Fla.

Research workers at Purdue University found brucellosis germs in hog carcasses kept three weeks in cold storage, the American Veterinary Medical Association was told.

The painful disease which the germs can cause in human beings is a serious occupational hazard of packing-house workers and farmers who butcher their own meat.

Brucellosis has been transmitted through the semen of an infected bull to susceptible heifers and cows by artificial insemination, Drs. C. A. Manthei, D. E. DeTray and E. R. Goode, Jr., of Beltsville Md., told the annual veterinarians convention.

Public health workers as well as veterinarians are attacking animal diseases which also strike at humans. These include brucellosis, rabies and Newcastle disease in poultry.

Scientists at the University of Maryland have found that the Newcastle disease virus is deadly in a wide variety of mammals such as hamsters, sheep, a calf and white mice. In Rhesus monkeys, an animal believed to closely approximate reactions in man, the virus produced paralysis and death.

The fact that more than a third of the meat eaten in this country has inadequate sanitary inspection points up the hazard from such diseases, Dr. H. G. Bailey of Savannah, Ga., told the convention. Only meat shipped across state lines now comes under federal inspection, he pointed out. The rest is subject only to checking by state or municipal health officers.

Science News Letter, September 2, 1950

● RADIO

Saturday, September 9, 3:15 p. m. EDST

"Adventures in Science" with Watson Davis, director of Science Service over Columbia Broadcasting System.

Mr. Davis will discuss the chemical advances as revealed at the Chicago meeting of the American Chemical Society and the National Chemical Exposition.

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IN A DEMOCRACY LIKE OURS it is particularly important that people as a whole should so far as possible understand the aims and achievements of modern science, not only because of the value of such knowledge to themselves but because research directly or indirectly depends upon popular appreciation of its methods. The specialist is likewise a layman in every science except his own and he, too, needs to have new things explained to him in non-technical language. Scientific progress is so rapid and revolutionary these days that no one can keep up with it without some means of keeping in close contact with its new ideas and discoveries.

SCIENCE CLUBS OF AMERICA

Thousands join in this great national movement dedicated to the development of science talent and sponsored by Science Service. About 15,000 clubs are organized in junior and senior high schools in every part of the United States and in 25 foreign countries to carry out hobbies, serious research and useful activities in science. Newspapers, museums, science teachers and professional scientists cooperate. Without charge, clubs are furnished with a handbook on science projects, lists of recommended books, free and low cost materials, cooperation on science fairs, etc.

SCIENCE TALENT SEARCH

The annual Science Talent Search for the Westinghouse Science Scholarships brings opportunity each year to students with special talent in science. In addition to the forty boys and girls who win five-day all-expense trips to the Nation's Capital and who compete for $11,000 in Westinghouse Science Scholarships, many more win Honorable Mention—a recognition that helps them get scholarships to colleges, universities and technical schools seeking able students. The Science Talent Search is extended in 23 states by state Science Talent Searches. It is an answer to a challenge to make potential scientific talent available for important tasks. Real ability for creative research is rare, and within a few years, boys and girls now in high schools must be ready to take the lead in scientific research.

RADIO

SCIENCE SERVICE has participated in radio continuously since the early days of broadcasting. Weekly programs include both the participation of guest scientists and science news talks.

BOOKS, ARTICLES, VISUAL AIDS

SCIENCE SERVICE edits and publishes books, prepares articles, produces film strips and other visual aids. Its collection of photographs is extensive.

INTERNATIONAL SERVICES

Cooperation is extended to newspapers, institutions and organizations in other countries. Through UNESCO and otherwise, scientific knowledge is shared with the peoples of the world.

LATIN-AMERICAN ACTIVITIES

Because of the demand from other American republics for scientific books, and the importance to health, industry, agriculture, etc., of the wide-spread distribution of such knowledge, Science Service, at the request of the Department of State of the United States of America, initiated in 1943 a program of aid to the publication of such translations.

NATIONAL SCIENCE FAIR

Newspapers, cooperating with Science Service, educators, scientific societies and industrialists, support local science fairs to which the public is invited. Secondary school students whose exhibits are judged best are selected to represent the cooperating newspaper's territory at the National Science Fair, conducted by Science Clubs of America. To each representative the solid gold and silver Finalist medal is awarded. Each has an opportunity to share more than $1,000.00 in scientific equipment awards and partake in a 3-day scientific adventure. The second National Science Fair will culminate in St. Louis in May 1951.

BOTANY

NATURE RAMBLINGS

Holly

➤ IT takes 18 years for a holly plantation to come into its best bearing. Many farmers, when their first child is born, set out holly cuttings in late August of that year, knowing that a profitable crop will come in just in time to meet college bills nearly 20 years later.

European holly, with the greenest leaves and reddest berries of nearly 300 species of the Yuletide trimming, is grown in favorable areas from the Virginia tidelands to the Pacific Northwest. Its market, although restricted largely to the month of December, is huge—so huge that those who simply go out and steal native American holly have all but wiped out this New World variety. By the torn bark and splintered ends of the branches can be seen the haste and destructiveness of its harvesting.

When it is grown as a cash crop the care of holly is exacting. In August, cuttings from top grade trees are planted in coldframes for the winter. They must be kept moist to ensure rooting. Sometimes they are treated with expensive growth-regulating chemicals to make sure roots will grow from the cut branch.

The following spring the young plants are transferred to cultivated garden rows. They grow there for one to two years. Then they are transplanted again to holly plantations, where they are kept in carefully thinned rows.

The farmer must know plant genders, for holly grows as both female and male trees. About one tree in ten in the plantation must be male. These bear no berries, but produce the pollen without which the female plants cannot bear fruit.

Historically, holly is older than Christmas. In German forests it figured in ancient pagan celebrations marking the beginning of the sun's return from its southward retreat, bringing with it the promise of another spring.

Holly was a sacred shrub not only among the Druids; it was highly esteemed by the Romans as well. Holly wreaths were hung at weddings. Pliny states that holly trees were planted to protect property from lightning. Thus even before it came to be a symbol of the Christmas spirit it was believed to enjoy the special favor of Jupiter, thunderbolt-wielding terror of the gods.

How far back of antiquity these early beliefs about holly go there is no way of guessing. One hint of very early human association with holly was found in the refuse heaps under the stilt-supported houses of Switzerland's Stone Age lake-dwellers. Holly seeds and twigs are abundant there. It is possible that these ancient people used the bitter stuff of the holly leaf, called ilicin, as a medicine or a beverage.

Science News Letter, September 2, 1950

VETERINARY MEDICINE

BAL, Anti-Gas Drug, Saves Dogs from Arsenic Poison

➤ A NEW antidote for arsenic poisoning of animals has been found in a wartime drug which would have been widely used by humans had poison gas attack ever come.

The drug is BAL, short for British Anti-Lewisite. Now it is being used to save the lives of horses and cattle accidentally poisoned on farms and ranches, Dr. George T. Edds of Texas A. & M. College told the American Veterinary Medical Association in Miami Beach, Fla.

BAL, Dr. Edds said, seems to combine with the atoms of arsenic, forming a new substance which is easily flushed from the animal system.

Hormone breakdown in cows after calves are born was reported by Dr. H. E. Kingman, Sr., of Cheyenne, Wyo., an authority on bovine obstetrics.

Although cows go through "childbirth without fear," he said, the nervous strain during delivery sometimes upsets the delicate glandular balance which controls the supply of hormones. Feeding the stricken mother through the veins helps save many cows which otherwise would die from calving disorders.

Veterinarians are still not winning their multi-million dollar game of hide-and-seek with livestock parasites. Dr. R. D. Turk of Texas A. & M. said worms and other parasites are a major problem on nearly all American farms and ranches.

Parasitic attack is often insidious—the animal is not sick, it eats well, but simply fails to gain weight. More than one species of parasite may be present, complicating enormously the problem of drug treatments.

Veterinarians and physicians working on the jig-saw puzzle of cancer are slowly building a large library of diseased animal tissue for research, the AVMA's annual convention was told.

The specimens go to a central collection point in Washington, the Registry of Veterinary Pathology, which is a branch of the Armed Forces Institute of Pathology. In an intricate automatic card indexing system relationships between diseases are being studied statistically, in the never-ending search to answer the riddle of cancer.

Science News Letter, September 2, 1950

MILITARY DEFENSE

"SAM" Protects Uncle From A-Bomb Planes

➤ UNCLE SAM has a namesake nephew upon whom he will rely for much of the protection he needs against planes carrying A-bombs. The nephew is "SAM," short for "surface-to-air missile."

"SAM" describes only one of the purposes of guided missiles. Artillery officers of all the services are now being trained in the use of both "SAM" and "SSM," surface-to-surface-missiles, according to the ANTIAIRCRAFT JOURNAL (August).

"SAM" will not only protect Uncle against planes carrying A-bombs to our shores, but it will be used in the field against planes attempting to strafe our troops.

"SSM" will be used by our field artillery against enemy troops, their equipment and positions.

In addition to "SAM" and "SSM," there are "AAM," air-to-air-missiles; "AUM," air-to-underwater-missiles; "UAM," underwater-to-air-missiles; "ASM," air-to-surface-missiles; "SUM," surface-to-underwater-missiles, and "USM," underwater-to-surface-missiles.

Regular officers of the Army, Navy, Marine Corps and Air Force with the necessary qualifications are being urged to apply for a 37-week course in guided missiles.

Science News Letter, September 2, 1950

ENGINEERING

Rice Blasting Removes Engine Carbon

➤ CARBON in combustion chambers of automobile engines is quickly removed by a blast of rice without taking off the cylinder head. The spark plug opening is used to reach the insides with a new device developed in Lansing, Mich., by the Oldsmobile division of General Motors.

The device is called a head-on carbon blaster. It is a cylindrical affair with a double-hose connection to the engine. It sends high-pressure air and rice into the combustion chamber through a nozzle at the end of one hose. Used rice and carbon flakes are sucked out through the other.

The operator works the nozzle tip up and down inside the chamber, at the same time rotating it to blast all parts of the cylinder wall. The rice under pressure chips off the carbon and thoroughly cleans the surface. A good cleaning requires less than five minutes per cylinder.

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• Books of the Week •

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organizations.

AMERICAN POLYDESMOID MILLIPEDS OF THE GENUS *SIGMORIA*, WITH NOTES ON DISTRIBUTION—Richard L. Hoffman—*American Museum of Natural History*, 7 p., paper, 25 cents.

THE AMSTERDAM NATURALIST, Vol. I, No. 1: Bulletin of the Zoological Museum Amsterdam—H. Engel and J. J. Hoedeman, Eds.—*De Regenboog*, monthly, 33 p., illus., $2.15 per year. A periodical containing reports on Dutch biological activities in English.

THE BASIS OF A DEVELOPMENT PROGRAM FOR COLOMBIA: A Report of a Mission—*International Bank for Reconstruction and Development*, 76 p., illus., paper, 50 cents. A summary of a more detailed report of Colombia's economic potentialities. Dr. Lauchlin Currie headed the mission.

BIG BOOK OF SCIENCE FICTION—Groff Conklin, Ed.—*Crown*, 545 p., $3.00. Thirty-two stories of science to come, atomic power, interstellar space, thought transfer and four dimensional adventures. Among the authors included are Lewis Padgett, Waldemar Kaempffert, Ray Bradbury and Murray Leinster.

BIOLOGY OF DROSOPHILA—M. Demerec, Ed.—*Wiley*, 632 p., illus., $10.00. The anatomy, histology and development of the vinegar fly so widely used in laboratories.

THE DEVELOPMENT OF A POLICY FOR INDUSTRIAL PEACE IN ATOMIC ENERGY—Donald B. Straus—*National Planning Association*, 104 p., paper, $1.00. The author discusses labor problems and labor relations in the atomic energy industry.

EDUCATION FOR A LONG AND USEFUL LIFE—Homer Kempfer—*Gov't. Printing Office*, 32 p., illus., paper, 20 cents. A bulletin primarily concerned with the problems of education for the aging.

ESSENTIALS OF MEDICINE: The Basis of Nursing Care—Charles Phillips Emerson, Jr. and Jane Elizabeth Taylor—*Lippincott*, 16th ed., 815 p., illus., $4.00. A basic handbook brought up-to-date.

THE FIRST ANESTHETIC: The Story of Crawford Long—Frank Kells Boland—*University of Georgia Press*, 160 p., illus., $3.00. The author writes a biography of the man he believes first used a surgical anesthesia.

THE FLOWER ARRANGEMENT CALENDAR 1951—Helen Van Pelt Wilson—*Barrows*, approx. 106 p., illus., paper, $1.00. A record book for day by day engagements. Well illustrated with black and white floral arrangements.

THE GENERA COLIBRI, ANTHRACOTHORAX, KLAIS, LOPHORNIS, AND CHLORESTES: Studies of Peruvian Birds. No. 57—John T. Zimmer—*American Museum of Natural History*, 28 p., paper, 25 cents. A brief report.

A NEW *SIGANUS* FROM THE GREAT BARRIER REEF, AUSTRALIA—Otis Barton—*American Museum of Natural History*, 2 p., paper, 25 cents. A brief description of a coral reef fish.

NEW TRINIDAD MYRMICINAE, WITH A NOTE ON *BASICEROS* SCHULZ (HYMENOPTERA, FORMICIDAE)—Neal A. Weber—*American Museum of Natural History*, 6 p., illus., paper, 25 cents. A brief report on the finding of some archaic ants in the British West Indies.

NUCLEAR PHYSICS: A Textbook—Francis Bitter—*Addison-Wesley*, 200 p., illus., $5.50. A textbook intended for students who have had a course in atomic theory in addition to the usual introductory physics course. (Due to typographical error, price incorrectly listed *SNL*, Aug. 26, p. 143.)

PHOTOGRAPHY IN ASTRONOMY—E. W. H. Selwyn—*Eastman Kodak*, 112 p., illus., $2.75. An introduction to astronomical photography.

PHYSICAL CHEMISTRY FOR PREMEDICAL STUDENTS—John Page Amsden—*McGraw-Hill*, 2nd ed., 317 p., illus., $4.25. A college text brought up-to-date.

PRINCIPLES OF COLOR SENSITOMETRY—C. F. J. Overhage, Ed.—*Society of Motion Picture and Television Engineers*, 72 p., illus., paper, $1.00. A basic text.

PROCEEDINGS VOLUME OF THE GEOLOGICAL SOCIETY OF AMERICA FOR 1949—*Geological Society of America*, 274 p., illus., paper, $1.50. Contains the proceedings of the annual meeting, reports of memorials and various committees of the Society.

PROCESS AND UNREALITY: A Criticism of Method in Whitehead's Philosophy—Harry Kohlsaat Wells—*King's Crown Press*, 211 p., $3.00. A discussion of the interrelations of Whitehead's natural philosophy and speculative system.

THE TRUTH ABOUT YOUR EYES—Derrick Vail—*Farrar, Straus*, 180 p., $2.50. A discussion of human eyes and how to protect them. For the layman.

VARIATION AND EVOLUTION IN PLANTS—G. Ledyard Stebbins, Jr.—*Columbia University Press*, 643 p., illus., $8.00. A general account of some of our latest findings in plant evolution.

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BACTERIOLOGY

Bacteria, Like Body Cells, Divide by Mitosis

➤ BACTERIA, one-celled microscopic organisms that can be both friend and foe to man, apparently divide by the same complex process, called mitosis, that human cells go through in dividing to make more of their number.

What is believed "the first clearcut evidence for mitosis in bacteria" was presented by Drs. Edward D. DeLamater and Stuart Mudd of Philadelphia at the Fifth International Congress of Microbiology in Rio De Janeiro.

The meaning of this fundamental discovery in terms of practical application cannot well be foreseen at present.

One-celled animals, such as amoebae and paramecia, are known to divide by the process of mitosis. Cells of larger plants, as well as larger animals, also undergo mitosis. But until now the nucleus of a one-celled plant has never been shown to do this. In fact, it is only within recent years that scientists were at all sure bacteria even had nuclei.

Chromosomes, at first elongated into delicate beaded threads and later shortened, condensed and thickened, were seen by the Philadelphia scientists in the nucleus of a microorganism called *Bacillus megatherium*.

At the metaphase stage of mitosis, the chromosomes were seen as two dense round bodies and a bar, giving a chromosomal number of three. Later they again appeared in beaded threads.

New techniques for staining and fixing the bacterial cells, including a quick freezing process, enabled the scientists to see the chromosomes and watch their behavior through the stages of mitosis.

Science News Letter, September 2, 1950

AGRICULTURE

Enough Fertilizer For Entire World

➤ WITHOUT fertilizer, the world would be a lot hungrier than it is. But this summer, the Food and Agriculture Organization of the United Nations reports, a vital postwar corner was turned. A record amount of fertilizer is being produced—enough, for the first time since World War II, to satisfy world demand.

For the fiscal year ending June 30, nearly 13,000,000 metric tons of fertilizer was produced, an all-time record. Russia was the only major country not included in the FAO statistics.

In the coming year—barring effects of the Korean conflict—FAO commodity experts predict fertilizer output and consumption will go up another seven percent. "Because countries can now plan crop production programs on a broader base of available fertilizer supply, their agronomic needs can be better satisfied," the report states. In terms a hungry world can better understand, the outlook for more food is good.

Science News Letter, September 2, 1950

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 532. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

HEATING ELEMENT, to keep automobile batteries and, others of the lead-acid type warm during cold weather, is an acid-resistant, electrically-energized unit which is submerged in the electrolyte. Electric energy is from an outside source. A thermostat responsive to the temperature of the electrolyte controls the heating.

Science News Letter, September 2, 1950

BICYCLE GEARSHIFT which can be installed in practically any of the present models is a three-speed device by which the rider may shift to low, medium or high gear ratio by means of a lever on the right handlebar. It replaces the rear axle and sprocket wheel.

Science News Letter, September 2, 1950

ELECTRIC STYLUS, fountain-pen size and designed to produce clean and clear-cut lines on wax-type stencils, operates on ordinary household current and delivers 7,200 strokes a minute. It can be used for glass writing and etching by the addition of an available diamond point.

Science News Letter, September 2, 1950

MIDGET STAPLER, shown in the picture, although only pocket-sized, can be used to fasten up to 20 sheets of paper together. When a latch at the rear is pressed,

the stapler opens for easy refilling. It comes in a plastic box with a transparent hinged top.

Science News Letter, September 2, 1950

PLATINUM-TIPPED BURETTE for the chemist is designed to deliver drops of approximately 0.01 millimeter. Burettes are glass rod containers with stopcocks and are used to add reagents drop by drop in chemical analysis. The platinum-alloy stem of this micro-burette is sealed in a glass tip which is removed for cleaning.

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LITTER PICKER for clearing lawns and parks, able to pick up cigarette butts as well as scraps of paper, is an aluminum cane with a pick-up head having a dozen or more sharp prongs. A perforated plate, through which the prongs pass, clears the litter by a push on the handle of the cane.

Science News Letter, September 2, 1950

LAWN SPREADER for grass seed or fertilizer recently patented, is a bucket-like container worn on the front of the user with a hand-operated crank on the side to rotate an inside blade. Materials in the hopper are kept agitated and are forced by the blade out through openings.

Science News Letter, September 2, 1950

ZIRCONIUM ARC LAMP, for use with microscopes either for direct viewing or obtaining micrographic photographs, provides a uniform, brilliant point source of light of low temperature in contrast with the flicker and heat of the carbon arc. The light spot can be varied in size by focusing adjustment.

Science News Letter, September 2, 1950

Do You Know?

A person does not have to be able to *smell* in order to taste.

Regulating the sulfur content of *smoke* reduces its damaging power.

Two dishes of *ice cream* make a satisfactory reducing lunch for a physically active man.

Refined granulated *sugar* is chemically the same whether it comes from sugar cane or sugar beets.

Brush growing along railroads is now being killed by chemical *sprays* from specially equipped spray cars on the tracks.

Spiders can go without food for months it is claimed; this fact enables them to live during the winter when insects for food may be unavailable.

Meat tenderness depends upon the amount of connective tissue and muscle plasma; the tenderest meat contains the least connective tissue and the most muscle plasma.